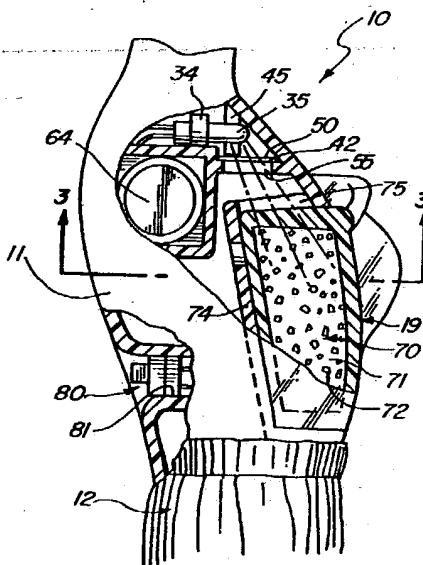




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 5 : A63H 33/22	A1	(11) International Publication Number: WO 93/23128 (43) International Publication Date: 25 November 1993 (25.11.93)
(21) International Application Number: PCT/US93/00245 (22) International Filing Date: 13 January 1993 (13.01.93) (30) Priority data: 07/883,740 15 May 1992 (15.05.92) US (71) Applicant: MATTEL, INC. [US/US]; 333 Continental Blvd., El Segundo, CA 90245-5012 (US). (72) Inventors: BENNETT, Linda, K. ; 1720 Ardmore Ave., #309, Hermosa Beach, CA 90254 (US). WITTENBERG, Mark ; 1872 W. Harriet Lane, Anaheim, CA 92804-5575 (US). (74) Agent: EKSTRAND, Roy, A.; Mattel, Inc., MS M1-1518, 333 Continental Blvd., El Segundo, CA 90245-5012 (US).		(81) Designated States: AU, CA, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i>

(54) Title: DOLL HAVING ILLUMINATED LIQUID FEATURE**(57) Abstract**

A doll (10) includes an internal battery (64, 65) power system for energizing an internally supported lightbulb (35). A liquid chamber (70) is formed within the interior of the doll body and supports a quantity of light transmissive liquid (71) therein. A quantity of reflective particles (72) are suspended within the captivated liquid. The energizing of the lightbulb illuminates the captive liquid through a movable multisegmented color filter (50) to impart colored illumination thereto. A portion (19) of the doll body is light transmissive and permits the illumination imparted to the liquid to be seen from the doll exterior. The filter is positionable to align alternative color segments with the lightbulb by tilting the doll from side to side.

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DOLL HAVING ILLUMINATED LIQUID FEATURE

SPECIFICATION

Field of the Invention

This invention relates generally to dolls and toy figures and particularly to those having changeable appearance features.

Background of the Invention

Dolls and toy figures have enjoyed great popularity among children for many years. Beginning with the simplest and most primitive of hand fashioned dolls and toy figures, the development has progressed to provide a virtually endless variety of such toys and amusement articles. To maintain the popularity of dolls and toy figures, practitioners in the art have endeavored to provide a variety of amusement and entertainment features for such toys. As a result of this effort, dolls and toy figures have been provided which have articulated limbs and body components which facilitate action and movement as well as other related activities such as changing outer garments or apparel or the like. Another active feature in such enhanced dolls and toy figures has been the provision of dolls and toy figures which are capable of changing appearance when manipulated by the user.

An interesting example of a changeable appearance feature doll is found in U.S. Patent 1,341,985 issued to Kemp which sets forth a DOLL includes a partially translucent or transparent outer skin and a plurality of liquid fillable reservoirs within the doll body. The

reservoirs are interconnected by coupling tubes. In its preferred form, the liquid is colored to impart a corresponding color tone to the doll's skin in the area of the liquid reservoirs. The user is able to manipulate the doll to transfer liquid between reservoirs and thus alter the color tone of the doll's skin in the reservoir areas.

In the general field of liquid filled toys and amusement devices, a variety of illuminated toy objects have been provided which utilize the combination of a liquid reservoir, a light illuminating the liquid, and a plurality of suspended light reflecting objects often referred to as "glitter" suspended within the liquid. One example of such amusement devices is found in U.S. Patent 4,967,321 issued to Cimock which sets forth a FLASHLIGHT WAND having a handle housing which includes an elongated transparent enclosure. A plurality of light reflecting objects are supported within the transparent enclosure and an illumination source within the wand transmits light through the enclosure to the reflecting objects.

U.S. Patent 4,600,974 issued to Lew, et al. sets forth an OPTICALLY DECORATED BATON which includes a transparent tube having an active or passive light emitting tube of a smaller diameter disposed coaxially therein. The annular cylindrical space between the transparent tube and the light emitting tube is filled with a liquid having numerous suspended light reflecting particles therein. Means are provided for illuminating the light emitting tube to cause light to permeate outwardly through the liquid and interact with the reflecting particles.

U.S. Patent 5,037,346 issued to Cimock sets forth a TOY FLASHLIGHT having an elongated cylindrical housing

supporting a plurality of batteries and a flashlight bulb together with a flashlight reflector. A globe is secured to the elongated housing and includes reflective objects having various colors and shapes therein. A plurality of colored filters are interposed between the flashlight bulb and the globe to impart a selected color to the light illuminating the objects within the globe.

U.S. Patent 4,834,688 issued to Jones sets forth an ARTICLE OF CLOTHING having a transparent pouch secured to the outer surface thereof. The transparent pouch is filled with a liquid representative of a beverage.

U.S. Patent 5,010,461 issued to Sotome sets forth a MULTI-COLOR PRESSURE-SENSITIVE ILLUMINATING DISPLAY PLATFORM for exhibiting an object illuminated by a selectable plurality of colors and/or light patterns. A generally planar housing includes a rest surface for the object having a light emitting area upwardly directed therefrom. A plurality of light filters are positioned beneath the rest surface and an illumination source is positioned within the planar base to provide an upwardly directed light beam passing through the filter and the to-be-illuminated object.

While the foregoing described toys and amusement devices provide additional variety and amusement for their respective users, there remains a continuing need in the art for evermore interesting, amusing and enjoyable appearance featured dolls and toy figures.

Summary of the Invention

Accordingly, it is a general object of the present invention to provide an improved doll or toy figure. It is a more particular object of the present invention to

provide an improved doll or toy figure having a dramatic appearance change capability.

In accordance with the present invention, there is provided a doll comprises: a doll body defining an interior cavity; an illuminatable light transmissive body portion supported by the doll body; and illumination means within the doll body for illuminating the light transmissive body portion.

Brief Description of the Drawings

The features of the present invention, which are believed to be novel, are set forth with particularity in the appended claims. The invention, together with further objects and advantages thereof, may best be understood by reference to the following description taken in conjunction with the accompanying drawings, in the several figures of which like reference numerals identify like elements and in which:

Figure 1 sets forth a front perspective view of a doll constructed in accordance with the present invention in a typical play activity;

Figure 2 sets forth a section view of the present invention doll taken along section lines 2-2 in Figure 4;

Figure 3 sets forth a section view of the present invention doll taken along section lines 3-3 in Figure 5;

Figure 4 sets forth a partially sectioned front view of a doll constructed in accordance with the present invention; and

Figure 5 sets forth a partially sectioned side view of the present invention doll.

Description of the Preferred Embodiment

Figure 1 sets forth a front perspective view of a doll having an illuminated liquid feature constructed in accordance with the present invention and generally referenced by numeral 10. Doll 10 includes a torso 11 defining a chest portion 25 and shoulders 23 and 24. Doll 10 further includes a lower torso (not shown) having downwardly extending legs terminating in feet 13 and 14. A pair of articulated arms 15 and 16 are joined to torso 11 at shoulders 23 and 24 in accordance with conventional fabrication techniques. A head 17 is constructed in accordance with conventional fabrication techniques and supports a quantity of hair 18 also conventional in construction.

In accordance with an important aspect of the present invention, torso 11 defines a bodice portion 19 extending upwardly from skirt 12 to chest 25. In further accordance with an important aspect of the present invention described below in greater detail, bodice 19 is preferably formed of a light transmitting material such as translucent or transparent molded plastic.

In further accordance with the present invention and by means set forth below in greater detail, bodice 19 supports an interior reservoir of light transmissive liquid (liquid chamber 70 seen in Figure 3) together with a battery powered illumination source (bulb 35 seen in Figure 2). Thus, when the illumination source within torso 11 is activated, the light produced thereby is transmitted to the liquid retained within bodice 19 causing illumination of the interior liquid chamber. The illumination of the liquid interior chamber of bodice 19

in turn radiates outwardly through the light transmissive material of bodice 19 causing bodice 19 to glow with illuminated light. In further accordance with the present invention by means set forth below in Figures 2 and 4 in greater detail, a movable color filter 50 imparts a selected color to the light illuminating the liquid reservoir within bodice 19. In the preferred embodiment, the colored filter is movable within torso 11 and comprises a plurality of different color segments which may be selectively positioned in cooperation with the illumination source by moving doll 10 in a rocking motion indicated by arrows 21 and 22 to the alternative dashed line positions shown in Figure 1. Thus, for example, the rapid movement of doll 10 in the direction indicated by arrow 22 positions one color segment of the colored filter therein into an operative position to impart that color to the illumination emanating outwardly from bodice 11. Conversely, movement of doll 10 in the opposite direction indicated by arrow 21 causes a different colored segment of the colored filter to be cooperatively positioned to impart its distinct color to the illumination light for bodice 19.

Thus, in accordance with an important advantage of the present invention structure, the color of light emanating from doll 10 through bodice 19 may be changed by the simple sideways movement shown in Figure 1. This is particularly advantageous to child users having limited manual dexterity. It will be apparent to those skilled in the art from the descriptions which follow that while the present invention is shown illuminating the bodice portion of doll 10, additional or alternative body portions may be illuminated by the present invention apparatus without departing from the spirit and scope of the present invention.

Figure 2 sets forth a section view of doll 10 taken along section lines 2-2 in Figure 4. Doll 10 includes a torso 11 defining a pair of shoulder portions 23 and 24 and having a bodice portion 19 supported thereby. Torso 11 further defines an interior cavity 30 having a transversely extending wall 40 and an opening 41 defined therein. Torso 11 also includes a chest portion 25 supporting a pair of downwardly extending ribs 44 and 45 and having a generally planar horizontal surface 42. A colored filter 50 preferably formed of an elongated planar member having a pair of transparent color segments 51 and 52, is slidably supported upon surface 42 and captivated thereupon by ribs 44 and 45. In accordance with the above-described operation, colored filter 50 is freely slidable upon surface 42 and is able to move in either direction as indicated by arrows 53 and 54.

A generally rectangular battery housing 31 is supported within interior cavity 30 of torso 11 and defines a bulb retainer 34 and a pair of apertures 32 and 33. An electric lightbulb 35 is received within and supported by bulb retainer 34 such that the light output portion of bulb 35 extends through opening 41 of wall 40 and is positioned above surface 42. Bulb 35 is coupled to the battery power source (seen in Figure 3) and to switch 80 (seen in Figure 5) by a pair of wires 36 and 37 which extend through apertures 32 and 33 of battery housing 31.

In operation, the activation of switch 80 provides battery power to bulb 35 causing bulb 35 to be illuminated and produce light energy which passes through the underlying segment of colored filter 50 and aperture 55 formed in surface 42 (better seen in Figure 4). The light transmitted through colored filter 50 assumes the hue or color of the underlying segment. Thus, in the position shown in Figure 2, colored filter 50 has been

moved in the direction indicated by arrow 53 to interpose segment 52 between bulb 35 and aperture 55. Thus, the light illuminating the liquid within bodice 19 of doll 10 will be colored in accordance with the color of segment 52. With temporary reference to Figure 1, it should be noted that the position of colored filter 50 shown in Figure 2 corresponds to the sideways motion of doll 10 in the direction indicated by arrow 21. In the event doll 10 is moved in the opposite direction to that indicated by arrow 22, colored filter 50 would be caused to slide in the direction indicated by arrow 54 in Figure 2 to the alternative position in which colored segment 51 is interposed between bulb 35 and aperture 55. Thus, the color of light illumination for bodice 11 would be changed from that of segment 52 to that of segment 51. In either event, the colored light illuminating the interior liquid chamber of bodice 19 would radiate outwardly through bodice 19 imparting the distinctive appearance thereto.

Figure 3 sets forth a section view of doll 10 taken along section lines 3-3 in Figure 5. As described above, torso 11 defines an interior cavity 30 within which a battery housing 31 is supported. Battery housing 31 includes a pair of battery connectors 61 and 63 coupled to electrical wires 60 and 62 respectively. A pair of conventional batteries 64 and 65 are received within battery housing 31 and are operatively connected to connectors 61 and 63. Torso 11 further includes bodice 19 which, as described above, is preferably formed of a light transmissive material such as transparent or translucent molded plastic material. Bodice 19 further defines a sealed liquid chamber 70 supporting a quantity of liquid 71 therein. Liquid 71 is preferably clear and supports a plurality of light reflective glitter particles 72. The character of glitter particles 72 is selected to provide the desired activity and tendency to

be easily suspended within liquid 71 particularly when doll 10 is agitated. As described above, bodice 19 surrounds liquid chamber 70 and is preferably formed of a transparent or other light transmissive material. It will be apparent to those skilled in the art that the transparent or light transmissive characteristic of the material forming bodice 10 readily accommodates the transmission of illumination light from bulb 35 which is used to illuminate liquid 71 within chamber 70. Thus, the light energy imparted to liquid 71 in turn is reflected by glitter particles 72 and radiates outwardly through the material of bodice 19.

Figure 4 sets forth a partially sectioned front view of doll 10. As described above, doll 10 includes a torso 11 having shoulders 23 and 24 and defining an interior cavity 30. As is also described above, doll 10 includes a pair of articulated arms 15 and 16 joined to shoulders 23 and 24 together with a lower torso portion (not shown) which supports a skirt 12. Torso 11 further includes a bodice portion 19 defining a liquid chamber 70 therein. Chamber 70 defines an upper wall 43 and is preferably formed of a transparent or other light transmitting material. A quantity of preferably clear liquid 71 is received within liquid chamber 70 and supports a plurality of reflective glitter particles in a liquid suspension. Upper wall 73 is formed of a transparent material and provides an upper seal for liquid chamber 70.

Torso 11 further defines a generally planar surface 42 having a pair of downwardly extending rib portions 44 and 45 spaced upwardly therefrom. Surface 42 defines an aperture 55 generally centered along the vertical axis of torso 11. A battery housing 31 is supported within interior cavity 30 and includes a bulb retainer 34. Retainer 34 supports an electric bulb 35 in general

alignment with aperture 55 of surface 42. A colored filter 50 formed of a generally planar elongated member includes a pair of transparent color tinted segments 51 and 52. In accordance with the present invention, colored filter 50 is freely movable from side to side on surface 42 and is captivated within interior cavity 30 by downwardly extending ribs 44 and 45. The size of filter 50 and segments 51 and 52 thereof is selected to provide alignment between segment 52 when filter 50 is positioned on one side of surface 42 in the manner shown in Figure 4 and, alternatively, to position segment 51 above aperture 55 when filter 50 is oppositely positioned on the other side of surface 42. Thus, the above-described motion of doll 10 to one side or the other causes filter 50 to move correspondingly and align either segment 51 or segment 52 with aperture 55 of surface 42.

In operation, bulb 35 is energized by batteries 64 and 65 (seen in Figure 3) to produce light energy. A portion of the light energy is directed downwardly through aperture 55 passing through colored filter 50. As described above, filter 50 may be positioned in the manner shown in Figure 4 in which segment 52 is aligned with aperture 55 or, alternatively, in a manner aligning segment 51. In either event, the light output energy of bulb 35 passes through the aligned one of segments 51 and 52 and thereafter through aperture 55 to impinge upper wall 73 of bodice portion 19. The transmissive characteristic of upper wall 73 permits the light energy to pass through wall 73 and illuminate liquid 71 within liquid chamber 70. It should be noted that the color of illuminating light which reaches liquid chamber 70 is determined for the most part by the color of the aligned one of segments 51 or 52 of filter 50 through which the light energy has passed. The illumination of liquid 71 also illuminates glitter particles 72 within the liquid causing a sparkling effect.

Thus, bodice portion 19 of doll 10 assumes a novel illuminated sparkling appearance which is seen through the light transmissive material of bodice 19. As a result, the color and appearance of bodice 19 of doll 10 is altered in accordance with the illumination of liquid 71 and glitter material 72 together with the position of colored filter 50. The child user may alter the color exhibited by bodice 19 by simply tilting doll 10 in the manner shown above in Figure 1 to slide colored filter 50 to its alternate position upon surface 42.

Figure 5 sets forth a partially sectioned side view of doll 10. Doll 10 includes a torso 11 defining an interior cavity 30 and a bodice portion 19. A skirt 12 is secured to torso 11 by conventional fabrication techniques. Torso 11 further defines a switch recess 81 which supports a conventional on/off switch 80. A battery housing 31 supporting a pair of batteries 64 and 65 as well as bulb 35 is supported within interior cavity 30 of torso 11. While not shown in Figure 5, it should be understood that switch 80, bulb 35 and batteries 64 and 65 are operatively interconnected by conventional wiring techniques such that switch 80 may be used to energize bulb 35 in the on position and interrupt its operating power when positioned in the off position. Torso 11 further defines a generally planar surface 42 having an aperture 55 formed therein. A downwardly extending rib 45 is positioned above surface 42. A colored filter 50 is slidably movable upon surface 42 in the manner described above to align a selected portion thereof with aperture 55.

Torso 11 further defines an interior wall 74 having an aperture 75 formed in the upper portion thereof. Aperture 75 is generally aligned with aperture 55 of surface 42. Bodice 19 includes a sealed liquid chamber 70 and is supported against wall 74. Bodice 19 is, as

described above, formed of a light transmissive material. A quantity of liquid 71 having a plurality of glitter particles 72 suspended therein is sealed within liquid chamber 70 of bodice 19.

In accordance with the above-described operation, the closure of switch 80 energizes bulb 35 and produces light energy. A portion of the light energy produced by bulb 35 passes through filter 50, aperture 55 and aperture 75 to illuminate liquid 71 within liquid chamber 70. The resulting illumination of liquid 71 causes bodice 19 to be illuminated with the colored light passing through filter 50. In addition, glitter particles 72 impart a sparkling characteristic to the light illumination of liquid 71 further enhancing the appearance of bodice portion 19.

It will be apparent to those skilled in the art that while the embodiment set forth in Figures 1 through 5 utilizes a filter having a pair of filter segments, a greater number of filter segments may be utilized in the present invention structure. It will be equally apparent to those skilled in the art that while the present invention doll shown in Figures 1 through 5 illuminates the bodice portion of a female doll figure, other toy figure configurations may be utilized in which alternative segments or portions of the toy figures may be illuminated. Thus, what has been shown is an improved doll or toy figure having an illuminated liquid feature in which a battery powered light source within the toy figure produces color tinted illumination of a visible liquid chamber to alter the doll or toy figure's appearance. The doll shown is capable of simple operation by even the youngest of children without the need of complex filter changing mechanisms to impart alternative colors to the illuminating light.

It should be noted that the present invention doll utilizes a liquid filled chamber having a plurality of glitter particles suspended therein to provide the luminous characteristic in response to the internal light source. It will be apparent to those skilled in the art, however, that other materials may be substituted for the captive liquid such as highly viscous gel material or the like without departing from the spirit and scope of the present invention. It will be further apparent to those skilled in the art that it may be desirable in certain applications of the present invention to utilize a solid or nearly solid transparent material in place of the transparent liquid within the present invention system. It should also be noted that the terms doll and toy figure as used herein are generally considered to be interchangeable and that the above-described application while shown in a doll embodiment applies equally well with equal advantage to a variety of toy figures. Thus, in the claims which follows, it should be understood that the term doll as used therein is inclusive of other toy figures and is not limited merely to dolls of the type shown in the embodiment set forth herein.

While particular embodiments of the invention have been shown and described, it will be obvious to those skilled in the art that changes and modifications may be made without departing from the invention in its broader aspects. Therefore, the aim in the appended claims is to cover all such changes and modifications as fall within the true spirit and scope of the invention.

THAT WHICH IS CLAIMED IS:

1. A doll comprising:

a doll body defining an interior cavity;

an illuminatable light transmissive body portion supported by said doll body; and

illumination means within said doll body for illuminating said light transmissive body portion.

2. A doll as set forth in Claim 1 wherein said illumination means includes a filter for imparting a selected color to the illuminating of said light transmissive body portion.

3. A doll as set forth in Claim 2 wherein said filter includes a plurality of differently colored segments.

4. A doll as set forth in Claim 3 wherein said doll body includes filter support means for supporting said filter and wherein said filter is movable with respect to said filter support means in response to angular tilting of said doll body.

5. A doll as set forth in Claim 1 wherein said light transmissive body portion includes a light transmissive outer member defining an interior chamber and a quantity of light transmissive material disposed therein.

6. A doll as set forth in Claim 5 wherein said light transmissive material is a liquid.

7. A doll as set forth in Claim 6 wherein said light transmissive material further includes a plurality of reflective particles suspendable within said liquid.

8. A doll as set forth in Claim 7 wherein said liquid is clear.

9. A doll as set forth in Claim 8 wherein said light transmissive body portion includes a human bodice.

10. A doll comprising:

a human-like doll body defining a liquid chamber having a portion thereof formed of light transmissive material;

a quantity of liquid received within said chamber; and

means for illuminating said liquid with light and causing a portion of said doll body to glow with said light.

11. A doll as set forth in Claim 10 wherein said means for illuminating includes a color filter for coloring the illumination thereof.

12. A doll as set forth in Claim 11 wherein said liquid further includes a plurality of particles suspendable in said liquid.

13. A doll as set forth in Claim 12 wherein said particles are reflective.

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FIG. 1



FIG. 2

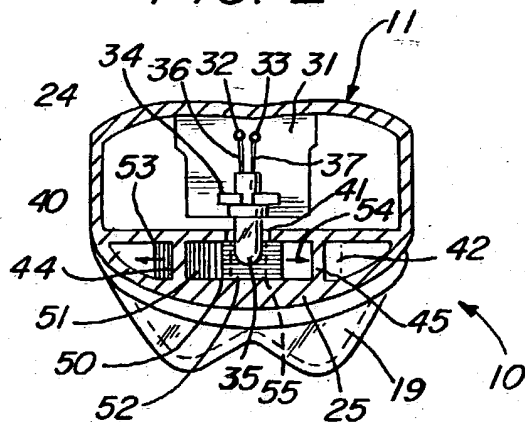


FIG. 3

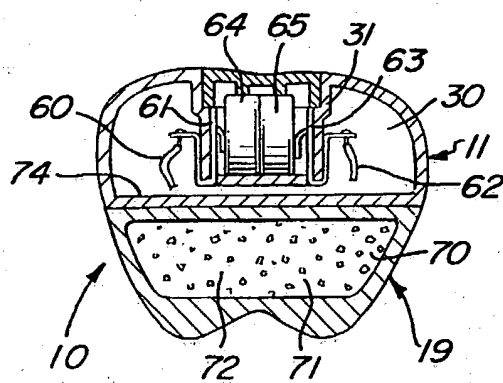


FIG. 4

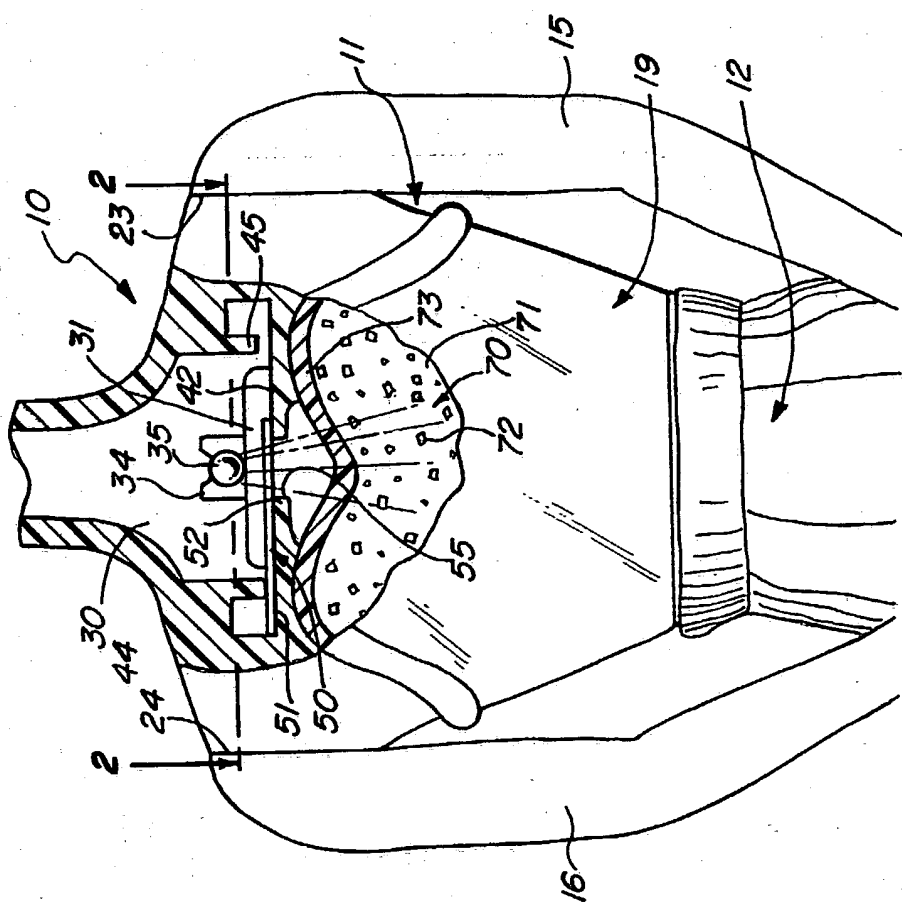
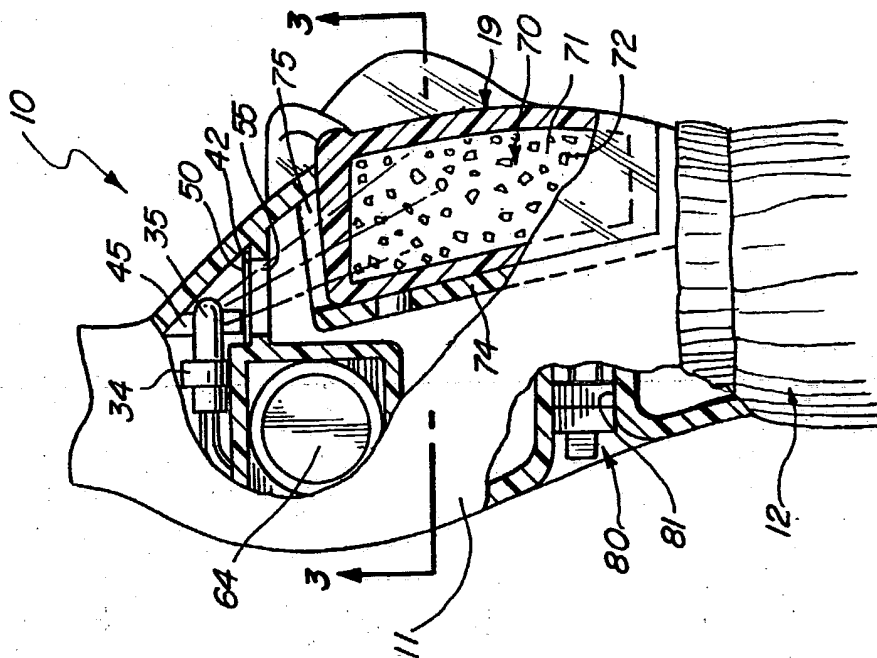


FIG. 5



INTERNATIONAL SEARCH REPORT

International application No.

PCT/US93/00245

A. CLASSIFICATION OF SUBJECT MATTER

IPC(5) :A63H 33/22

US CL :446/219

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 446/267, 268, 295, 296, 385, 389, 390, 391, 242, 485; 362/293, 808

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
<input checked="" type="checkbox"/> X Y	US, A, 4,878,873 (Yamaguchi et al.) 07 November 1989, See entire document.	1,5 2-4,6-9
Y	US, A, 2,370,601 (Wimpfheimer et al.) 27 February 1945, Figures 6 and 7, light filter 61.	2,3
Y	US, A, 2,038,784 (Ghadiali) 28 April 1936, Figure 1, Filters 78.	4
Y	US, A, 4,242,830 (Hauser) 06 January 1981, Figure 2, Fluid 12.	6
Y	US, A, 4,507,099 (Kinberg) 26 March 1985, Figure 2, particles 21.	7-13

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	T	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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26 APR 1993

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INTERNATIONAL SEARCH REPORT

International application No.
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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US, A, 4,585,424 (DeMars) 29 April 1986, Figure 2, light 24.	10-13